Please carefully read and save these instructions before attempting to assemble, maintain, install, or operate this product. Observe all safety information to protect yourself and others. Failure to observe the instructions may result in property damage and/or personal injury. Please keep instructions for future reference.

Important Operating Instructions

100 AMP ARC WELDER

Model: 7644

CALIFORNIA PROPOSITION 65

WARNING: You can create dust when you cut, sand, drill or grind materials such as wood, paint, metal, concrete, cement, or other masonry. This dust often contains chemicals known to cause cancer, birth defects, or other reproductive harm. Wear protective gear.

WARNING: This product or its power cord may contain chemicals, including lead, known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

Important!

When using equipment, a few safety precautions must be observed to avoid injuries and damage. Please read the complete operating manual with due care. Keep this manual in a safe place, so that the information is available at all times. If you give the equipment to any other person, give them these operating instructions as well. We accept no liability for damage or accidents which arise due to non-observance of these instructions and the safety information herein.

SPECIFICATIONS

Input: 230V, Single Phase, 22 Amps
Open Circuit Voltage: 48 Volts
Welding Current: 40-100 Amps
Duty Cycle: 10% @ 70 Amps; 50% @ 100 Amps

CAUTION:

FOR YOUR OWN SAFETY, READ INSTRUCTION MANUAL COMPLETELY AND CAREFULLY BEFORE OPERATING THIS ARC WELDER.

Any failures made in following the safety regulations and instructions may result in an electric shock, fire, and/or serious injury.

SAFETY INSTRUCTIONS

WARNING: Always keep a fire extinguisher accessible while using an arc welder.

Before staring or servicing any electric arc welder, read and understand all instructions and warnings. Failure to follow the safety guidelines or instructions can cause damage to the equipment or personal injury or death.

All installation, maintenance, repair and operation of this welder should be performed by qualified users only in accordance with local, state and national law codes.

WARNINING: Improper use of electric arc welders can cause electric shock, injury and death.

Before using this welder, be sure that all components are clean and in proper working order. Check the insulation on all cables, electrode holders and power cords for damage. Always repair or replace damaged parts before operating the welder.

For warranty purchases, please keep your dated proof of purchase. File or attach to the manual for safekeeping.

Always keep the welder panels, shields, etc, in place while operating the welder.

Always wear protective closing and welding gloves and insulated footwear.

Do not operate the welder in wet, humid, rainy or poor ventilated areas.

Ensure that the work piece is properly supported and grounded before beginning any welding process.
A coiled welding cable should be spread out before use to avoid overheating and damage to the insulation.

Never immerse the electrode or electrode holder in water. If the welder becomes wet for any reason, do not use the welder again until certain it is completely dry and clean.

Always shut the equipment off and unplug the power cord before moving the welder.

Always attach the work lead first.

Always shut of the welding equipment when it is not in use and remove the electrode from the holder.

Do not allow any part of the body to touch the electrode and ground or grounded work piece at the same time.

Awkward welding conditions and positions can be hazardous. When working in a crouching, kneeling or elevated position, ensure all parts are insulated, wear appropriate protective clothing and take precautions to prevent injury from falling.

Never attempt to use this welder at current settings or duty cycles higher than specified on the equipment labels.

Never use an arc welder to thaw frozen pipes.

Flying sparks and hot metal can cause personal injury and property damage. As a weld cools, slag can be thrown off. Take all precautions to reduce the possibility of injury from flying sparks and hot metal.

Wear ANSI approved face shield or safely glasses with side shield protection when chipping or grinding metal parts.

Wear ear plugs when welding overhead to prevent spatter or slag from falling into the ears.

WARNINING: Arc welding operations produce intense light, heat and ultraviolet (UV) rays. Intense light and UV rays can cause injury to eyes and skin. Take all precautions to reduce the possibility of injury to the eyes and/or skin.

All persons operating this welder or in the vicinity of this equipment while it is being used must wear proper protective welding gear including: a welding helmet or shield with at least shade 10, flame resistant clothing, leather welding gloves and full foot protection.

WARNINING: Never look directly into arc welding operations without proper eye protection. Do not use a shade filter lens that is cracked, broken or rated below number 10. Warn others in the area not to look at the arc.

WARNINING: Arc welding operations cause sparks and heat metal to temperatures that can cause severe burns. Use protective clothing and gloves while performing any metal working operations and be sure to take all precautions to reduce the possibility of clothing and skin burns.

Make sure that any person in the welding area is protected from heat, ultraviolet rays and sparks.. Use flame resistant barriers and additional face shields as needed.

Never touch any work piece until it has completely cooled.

WARNINING: Heat and sparks produced by any metal working operation can ignite flammable and explosive materials. Be sure to take all precautions to reduce the possibility of explosions and flames.

Remove all flammable materials within 35 feet (10.7 meters) of the welding arc. If removal is not possible, be sure to tightly cover any flammable materials with fire proof covers.

Do not operate any arc welder in areas where explosive or flammable vapors may be present.

Be sure that flying sparks and heat do not cause flames in hidden areas, cracks, behind bulkheads, ect.

WARNINING: Do not weld on containers or pipes that have or have had contained flammable materials or gaseous or liquid combustibles.

WARNINING: Arc welding closed cylinders or containers such as tanks or drums can cause explosions if not properly vented. Make sure any cylinder or container to be welded has an adequate ventilation hole so that expanding gases can be released.

WARNING: Do not breathe fumes that are produced by the arc welding operation. The fumes are dangerous. If the welding area cannot be ventilated, use an air-supplied respirator.

Keep head and face out of the welding fumes.

Do not perform electric arc welding operations on metals that are galvanized or cadmium plated, or contain zinc, mercury or beryllium without completing the following precautions. 1) Remove the coating from the base metal. 2) Ensure the welding area is well ventilated. 3) Use an air supplied respirator. Extremely toxic fumes are created when these metals are heated.

WARNING: The electromagnetic field that is generated during arc welding may interfere with operations of various electrical and electronic devices such as cardiac pacemakers. Persons with such a device should consult their physician before using an electric arc welder.

Route the electrode and work cables together and secure with tape when possible.

Never wrap arc welder cables around the body.

Always position the electrode and work leads so that they are on the same side of the body.

WARNING: Always ensure the welding area is secure and free of hazards prior to leaving. Ensure all equipment is turned off and the electrode is removed. Ensure all metal and slag has cooled an that the cables are loosely coiled and out of the way.

INSTALLATION

Location

Selecting the proper location can increase performance, reliability and the life of the arc welder. For the best results, locate the welder in a clean and dry environment. Dust and dirt can cause the welder to retain moisture and increase wear of moving parts.

Store electrodes in a clean, low humidity, dry location to preserve the flux coating.

The receptacle used for the welder must be properly grounded and the welder must be the only load on the power supply circuit.

The use of an extension cord is not recommended for arc welding machines because the cord will significantly decrease the performance of the welder.

ASSEMBLY

Handshield (optional)

1) Cut the detachable handle away from the shield. Trim the excess plastic to remove the sharp edges.

2) Insert filter lens.

3) To attach the handle, place the shield on a flat surface and press the handle in place.

If you have never welded or have little experience welding,

a full face helmet is recommended to allow both hands to stabilize and control the angle and arc length of the electrode.

OPERATION

WARNING: Any person operating this equipment or in the area of its use must wear protective welding gear including: eye protection with a minimum shade 10 lens, flame resistant clothing, leather welding gloves and full foot protection.

1) Ensure welder is off. Plug into appropriate receptacle: 115v-15amp – Low, 114v-20amp – High.

2) Verify that the surfaces of metals to be joined are free from dirt, rust, paint, oil, scale or other contaminants. These contaminants will make welding difficult and cause poor welds.

3) Connect the work clamp to the work piece. Ensure the contact is on bare metal and not obstructed by paint, varnish, corrosion, or non metallic materials.

4) Insert the exposed part of the electrode rod (the end with no fliux) into the jaws of the electrode holder. NOTE: The electrode holder and rode are electrically "live" when the welder is on.

5) Hold the electrode away from the grounded work piece or bench. Turn on the welder to either high or low. Electrode diameter: 1/16in - Output setting: Low. Electrode diameter: 5/64in - Output setting: High.

6) Position the electrode to begin weld, lower the welding helmet or position the shield and strike an arc. Adjust the output setting as needed.

7) When finished welding, turn welder off and store properly.

Duty cycle/Thermostatic protection
Welder duty cycle is the percentage of actual weld time that can occur in a ten minute interval. 10% duty cycle – 1 minute of actual welding and 9 minutes cool down time. The internal components of the welder are protected from overheating with an automatic thermal switch

MAINTENANCE

Disconnect the power supply and turn machine off before inspecting or servicing any components.

Before every use:

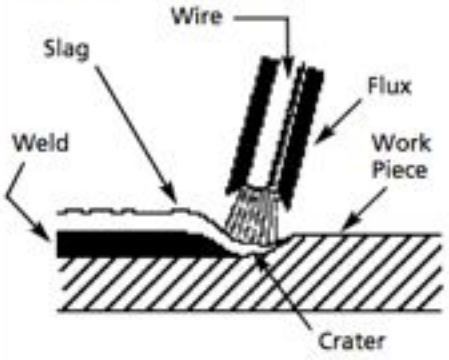
1) Check the condition of the weld cables and repair or replace any cables with damaged insulation before use.

2) Check the condition of the power cord and immediately repair or replace the cord, if damaged, before use.

3) Check the condition of the electrode holder insulating pieces and immediately replace any cracked or missing insulators. Verify that all fasteners are tight and insulated.

Every 3 months:
Replace any unreadable labels on the welder. Use compressed air to blow all dust and debris from the ventilation openings.

WELDING GUIDELINES



Striking an arc

Attach work clamp to work piece. The jaws of the work clamp must make good contact with clean bare metal of the work piece for good welding results.

Place the bare end of the electrode in the holder. Grip the holder lightly to reduce tiring of the hand and arm.

Note: Always keep the jaw of the holder clean to ensure good electrical contact with the electrode.

Be careful not to touch the work piece or welding bench with the electrode as this causes arc flashes.

The best method for striking an arc is the scratching method. Drag the electrode at an angle along the surface, like striking a match. Upon contact with the plate, lift the electrode slightly off the surface or it will stick. If the electrode sticks, break it loose by quickly turning or bending at the holder while pulling upward. If the electrode does not break loose, disengage the electrode by releasing it from the holder.

ARC WELDING BASICS

Four basic techniques affect weld quality. These are: amperage setting, weld angle, arc length and travel speed. Proper use of these techniques is necessary for good weld quality.

Amperage Setting

The correct amperage involves the adjustment of the welding machine to the required amp setting. This is regulated by selecting the appropriate high or low setting. The amperage required depends on the size (diameter) of electrode used and the thickness of the piece.

Excessive currents burn through light metals and the weld bead is flat and porous. The bead appears high and irregular if the current is too low.

Weld Angle

Weld angle is the angle at which the electrode is held during the welding process. Using the correct angle ensures proper penetration and bead formation. Electrode angle involves two positions, travel angle and work angle.

Travel angle is the angle in the line of welding and varies from 5 degrees to 45 degrees from the vertical, depending upon welding conditions.

Work angle is the angle from the horizontal, measured at right angles to the line of welding.

For most applications, a 45 degree travel angle and 45 degree work angle is sufficient. For specific applications, consult an arc welding handbook.

Right handed welders should work from left to right. Left handed welders should weld from right to left.

Arc length

Arc length is the distance from the work piece to the tip of the electrode, the distance which the arc must travel. A proper arc length is essential to generate the heat needed for welding. An arc that is too long produces an unstable arc, reduces penetration, increases spatter and causes flat and wide beads. Too short an arc does not create enough heat to melt the work piece, the electrode has a tendency to stick, penetration will be poor, and uneven beads with irregular ripples result. A proper arc should be no longer than the diameter of the rod. The sound of a proper arc is a stead, crisp sizzle.

Travel speed

Weld appearance diagram on page 8

The travel speed is the rate at which the electrode is moved across the arc weld area. When the speed is too fast, the bead is narrow and ripples are pointed. When the speed is too slow, the weld metal piles up and the bead is high and wide. To control travel speed, watch the width of the weld beat, not the arc, when welding. The weld bead is the orange, molten metal behind the arc. The width should be approximately twice the diameter of the welding rod. Control the travel speed to obtain a consistent bead width.

Slag removal

After completing the weld, wait for the heated sections to cool. A protective coating called slag now covers the weld beat, which prevents contaminants in the air from reacting with the molten metal. Once the weld cools to the point it is no longer

glowing red, the slag can be removed. Removal is done with a chipping hammer. Lightly tap the slag with the hammer and

break it loose from the bead. The final clean up is done with a wire brush. When making multiple weld passes, remove the slag between each pass.

Welding positions

Four basic welding positions can be used: flat, horizontal, vertical and overhead.

Welding in the flat position is the easiest because the welding speed can be increased, molten metal has a less tendency to run, better penetration can be achieved and the work is less fatiguing.

Other positions require different techniques such as a weaving pass, circular pass and jogging. A higher skill level is required to complete these welds. All work should be performed in the flat position if possible. For more specific welding instructions, consult an arc welding handbook.

Weld passes

Sometimes it is necessary for more than one pass to fill the joint. The root pass is first, followed by filler passes and lastly the cover pass. If the pieces are thick, it may be necessary to bevel the edges that are joined at a 60 degree angle. Remember to remove the slag between each pass.

Troubleshooting Guide

Welder

Problem	Possible Cause(s)	Solutions
Welder does not hum when turned on	No power at receptacle	Check circuit fuse or circuit breaker
	Broken or damaged power cord	Power cable requires service
Welder hums but does not weld	Inadequite current at electrode	Check work and electrode clamp, work and electrode cable and connection to work piece
	Poor connections at welder	Check all welder external connections
Welder gives trickle shocks	Accidental contact with work piece	Avoid contact with work piece
	Current leackage caused by moist clothing or work area	Make sure clothing and work area are dry
Welder overheats - blows fuses or trips circuit breaker	Use of extension cord	Avoid use of extension cord. If not possible, use thicker (lower gauge number) extension cord
	Electrode diameter too large	Use smaller diameter electrode
	Overloaded circuit	Welder requires a dedicated circuit
Arc difficult to strike	Wrong type of electrode	Verify electrode is for alternating current use
	Electrode diameter too large	Use smaller diameter electrode
	Work piece not properly grounded	Verify proper grounding (No paint, varnish or corrosion)
	Heavy loads making poer line voltage low	Run welder on dedicated circuit

Welds

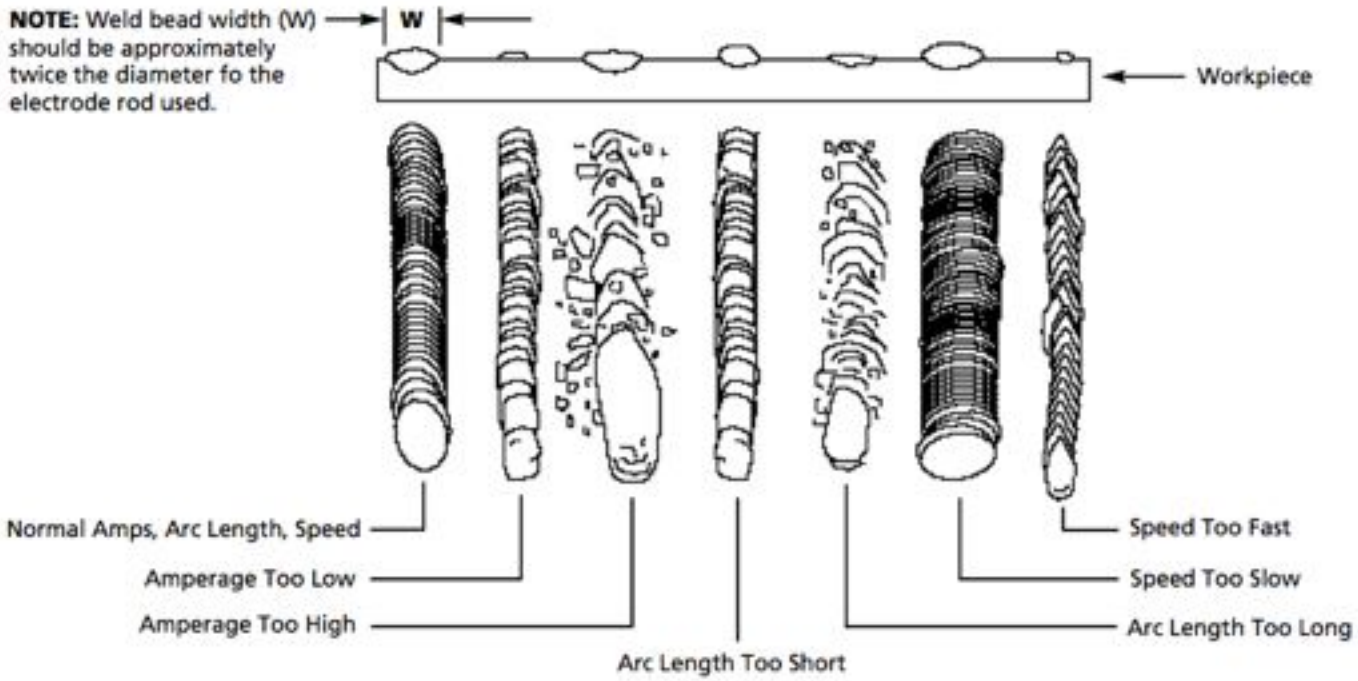
Problem	Possible Cause(s)	Solutions
Bead is intermittently to think or thick	Inconsistent travel speed	Watch and control the width of the motlen weld bead
	Ooutput amp setting incorrect	Adjust output amp setting or change to smaller diameter electrode
Ragged depressions at edge of weld	Travel speed too fast	Watch orange molten weld puddle and control bead width
	Arc length too short	Practice running electrode across workpiece with welder OFF
	Electrode diameter too large	Recommend either 1/16 or 5/64 inch diameter electrodes
Electrode sticks to work piece	Arc length too short	Lift electrode to correct arc length as soon as arc is struck
	Amp setting too low	Increase amp setting or change to smaller diameter electrode
Electrodes sputter and stick	Damp electrodes	Use dry electrodes and store in dry location

Limited Manufacturer Warranty

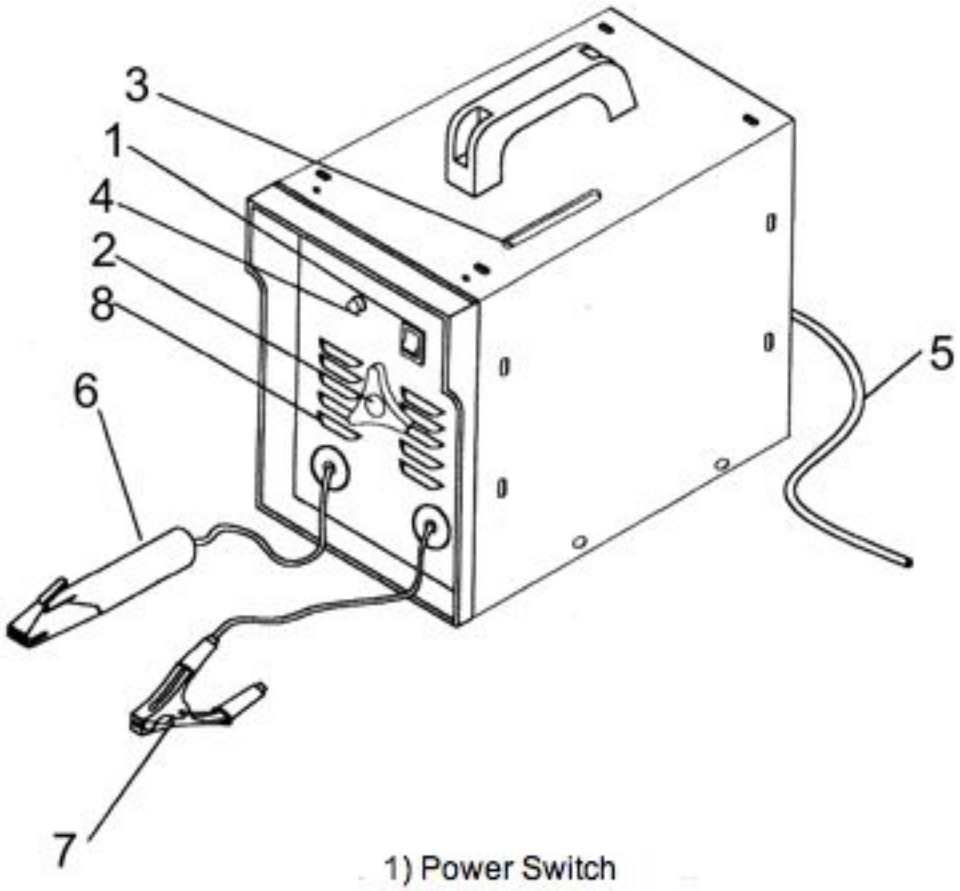
North American Tool (NAT) Industries makes every effort to ensure that this product meets high quality and durability standards. NAT warrants to the original retail consumer a 1-year limited warranty from the date the product was purchased at retail and each product is free from defects in materials. Warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence, or accidents, repairs or alterations, or a lack of maintenance. NAT shall in no event be liable for death, injuries to persons or property, or for incidental, special, or consequential damages arising from the use of our products. To receive service under warranty, the original manufacturer part must be returned for examination by an authorized service center. Shipping and handling charges may apply. If a defect is found, NAT will either repair or replace the product at its discretion.

DO NOT RETURN TO STORE

For Customer Service:
Email: feedback@natitools.com or Call 1-800-348-5004


NOTE: Weld bead width (W) should be approximately twice the diameter fo the electrode rod used.
W
Workpiece
Normal Amps, Arc Length, Speed
Amperage Too Low
Amperage Too High
Arc Length Too Short
Speed Too Fast
Speed Too Slow
Arc Length Too Long

Parts List



1) Power Switch
2) Current Switch
3) Current Scale
4) Over-Temp Indicator
5) Power Cable
6) Electrode Holder
7) Ground Clamp
8) Air Vent